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6613850, A2000-14-7855-027; 20000601.

Title

Spectroscopy and characterisation of Ce/sup 3+/-doped pure or mixed Lu /sub x/(RE/sup 3+//sub 1-x/AlO/sub 3/ scintillators.

Author(s)

Mares-J-A.

Author affiliation

Inst of Phys, Czechoslovak Acad of Sci, Prague, Czech Republic.

Source

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Treatment codes

X Experimental.

Abstract

Spectroscopic properties of newly developed mixed Lu/sub x/(RE/sup 3+ //sub 1-x/AP:Ce crystals (RE/sup 3+//) are presented. These properties are compared with those of pure YAP:Ce, GdAP:Ce and LuAP:Ce crystals and qualitative discussion of Ce/sup 3+// or Ce/sup 3+// defect-related centres in crystals is presented. A comparison of spectroscopic and scintillation properties of newly developed

Lu/sub x/(RE/sup 3+//sub 1-x/AP:Ce crystals show that the most promising crystal for scintillation applications seems to be Lu/sub 0.3/Y/sub 0.7/AP:Ce but from the point of view of stopping power and Z/sub eff/, Lu/sub x/Gd /sub 1-x/AP:Ce crystals would probably be better. (24 refs).

Descriptors

cerium; colour-centres; fluorescence; gadolinium-compounds; lutetium-compounds; scintillation; ultraviolet-spectra; vacancies-crystal; yttrium-compounds.

Keywords

Lux Y3 1 xAlO3; Lux Gd3 1 xAlO3; scintillators; Ce3 doping; spectroscopic properties; defect related centres; scintillation properties; absorption spectra; emission spectra; excitation spectra; fluorescence decay kinetics; LuY AlO3:Ce; LuGd AlO3:Ce.

Classification codes

A7855H (Photoluminescence in other inorganic materials).
A6170B (Interstitials and vacancies).
A6170D (Colour centres).
A7840H (Visible and ultraviolet spectra of other nonmetals).
A7155H (Impurity and defect levels in other nonmetals).

Chemical indexing

LuYAlO3:Ce ss, LuYAlO3 ss, Al ss, Ce ss, Lu ss, O3 ss, O ss, Y ss, Ce el, Ce dop; LuGdAlO3:Ce ss, LuGdAlO3 ss, Al ss, Ce ss, Gd ss, Lu ss, O3 ss, O ss, Ce el, Ce dop.

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4	BRS	7	(luyap luap) and scintil\$7	USPAT; US-PGPUB; EPO; JPO; DERWENT
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13	BRS	0	yluap	USPAT; US-PGPUB; EPO; JPO; DERWENT
14	BRS	8	(yap and scintil\$7) and lut\$7	USPAT; US-PGPUB; EPO; JPO; DERWENT
15	BRS	5	(yap and scintil\$7) and lutet\$7	USPAT; US-PGPUB; EPO; JPO; DERWENT
16	BRS	2	luap and yap	USPAT; US-PGPUB; EPO; JPO; DERWENT
17	BRS	11	yap and lutet\$6	USPAT; US-PGPUB; EPO; JPO; DERWENT
18	BRS	79	"4421671" "4473513" "4525628" "4783596" "6093347"	USPAT; US-PGPUB; EPO; JPO; DERWENT
19	BRS	12	("4421671" "4473513" "4525628" "4783596" "6093347").pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT
20	BRS	23457	yttrium and alumin\$4	USPAT; US-PGPUB; EPO; JPO; DERWENT
21	BRS	23489	yttri\$4 and alumin\$4	USPAT; US-PGPUB; EPO; JPO; DERWENT
22	BRS	1369	yttri\$4 and alumin\$4 and lutet\$4	USPAT; US-PGPUB; EPO; JPO; DERWENT
23	BRS	515	yttri\$4 same alumin\$4 same lutet\$4	USPAT; US-PGPUB; EPO; JPO; DERWENT
24	BRS	17	yttri\$4 same alumin\$4 same lutet\$4 and scintil\$6	USPAT; US-PGPUB; EPO; JPO; DERWENT
25	BRS	13	yap and pet and scintillat\$5	USPAT; US-PGPUB; EPO; JPO; DERWENT

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26	BRS	118	yso	USPAT; US-PGPUB; EPO; JPO; DERWENT
27	BRS	27	yso and scintil\$7	USPAT; US-PGPUB; EPO; JPO; DERWENT
28	BRS	96	gso and scintil\$7	USPAT; US-PGPUB; EPO; JPO; DERWENT
29	BRS	94	lso and scintil\$7	USPAT; US-PGPUB; EPO; JPO; DERWENT
30	BRS	10	(yso and scintil\$7) and (gso and scintil\$7) and (lso and scintil\$7)	USPAT; US-PGPUB; EPO; JPO; DERWENT
31	BRS	1	lso and yso and (lyso or ylso)	USPAT; US-PGPUB; EPO; JPO; DERWENT
32	BRS	477	Lutetium near2 Yttrium	USPAT; US-PGPUB; EPO; JPO; DERWENT
33	BRS	25	Lutetium near2 Yttrium and scintil\$7	USPAT; US-PGPUB; EPO; JPO; DERWENT
34	BRS	1	lyap	USPAT; US-PGPUB; EPO; JPO; DERWENT
35	BRS	24	lao and scintil\$7	USPAT; US-PGPUB; EPO; JPO; DERWENT
36	BRS	1	lao same scintil\$7	USPAT; US-PGPUB; EPO; JPO; DERWENT
37	BRS	18	(US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.	USPAT; US-PGPUB; DERWENT
38	BRS	7	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and luap	USPAT; US-PGPUB; EPO; JPO; DERWENT

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40	BRS	7	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and pet and (yap or luap)	USPAT; US-PGPUB; EPO; JPO; DERWENT
41	BRS	1	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and pet and gantry	USPAT; US-PGPUB; EPO; JPO; DERWENT
42	BRS	2	(yap or luap) and pet and gantry	USPAT; US-PGPUB; EPO; JPO; DERWENT
43	BRS	2	yap and pet and gantry	USPAT; US-PGPUB; EPO; JPO; DERWENT
44	BRS	354	250/363.03	USPAT; US-PGPUB; EPO; JPO; DERWENT
45	BRS	3	250/363.03 and yap	USPAT; US-PGPUB; EPO; JPO; DERWENT
46	BRS	23	250/363.03 and lso	USPAT; US-PGPUB; EPO; JPO; DERWENT
47	BRS	6	250/363.03 and yso	USPAT; US-PGPUB; EPO; JPO; DERWENT
48	BRS	16	250/363.03 and gso	USPAT; US-PGPUB; EPO; JPO; DERWENT

	Type	Hits	Search Text	DBs
49	BRS	26	(250/363.03 and lso) (250/363.03 and yso) (250/363.03 and gso)	USPAT; US-PGPUB; EPO; JPO; DERWENT
50	BRS	3	(250/363.03 and lso) and (250/363.03 and yso) and (250/363.03 and gso)	USPAT; US-PGPUB; EPO; JPO; DERWENT
51	BRS	6	(250/363.03 and lso) and (250/363.03 and yso)	USPAT; US-PGPUB; EPO; JPO; DERWENT
52	BRS	13	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and (yap or luap)	USPAT; US-PGPUB; EPO; JPO; DERWENT
53	BRS	5306	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and (yap or luap) and gamma or positron	USPAT; US-PGPUB; EPO; JPO; DERWENT
54	BRS	12	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and (yap or luap) and (gamma or positron)	USPAT; US-PGPUB; EPO; JPO; DERWENT

	Type	Hits	Search Text	DBs
55	BRS	10	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and (yap or luap) and positron	USPAT; US-PGPUB; EPO; JPO; DERWENT
56	BRS	1	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and luap and (pet or positron)	USPAT; US-PGPUB; EPO; JPO; DERWENT
57	BRS	2	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and luap and coincidence	USPAT; US-PGPUB; EPO; JPO; DERWENT
58	BRS	0	pi.in and pet	USPAT; US-PGPUB; EPO; JPO; DERWENT
59	BRS	5	pi.in. and pet	USPAT; US-PGPUB; EPO; JPO; DERWENT

	Type	Hits	Search Text	DBs
60	BRS	6	((US-6437336-\$ or US-6278832-\$ or US-6194726-\$ or US-5961714-\$ or US-6552348-\$ or US-6521894-\$ or US-6093347-\$ or US-4783596-\$ or US-5600135-\$ or US-6534771-\$ or US-6078052-\$ or US-6232605-\$ or US-6323489-\$ or US-5204021-\$).did. or (US-20020195565-\$ or US-20030076914-\$ or US-20030062465-\$).did. or (WO-9504289-\$).did.) and pet and yap	USPAT; US-PGPUB; EPO; JPO; DERWENT
61	BRS	12	yap and positron	USPAT; US-PGPUB; EPO; JPO; DERWENT